Time's running out as physicians await Y2K fallout

Anita Elash

In brief

CANADA'S HOSPITALS ARE SLOWLY COMING TO GRIPS with the millennium bug, but Anita Elash reports that no one really knows what impact the move into the year 2000 will have on computers and medical devices, either in the hospital or doctor's office.

En bref

LES HÔPITAUX DU CANADA S'ATTAQUENT LENTEMENT au bogue du millénaire, mais Anita Elash signale que personne ne connaît vraiment l'impact que l'avènement de l'an 2000 aura sur les ordinateurs et les dispositifs médicaux, que ce soit à l'hôpital ou au cabinet du médecin.

Features

Chroniques

Anita Elash is a Canadian writer now based in Prague.

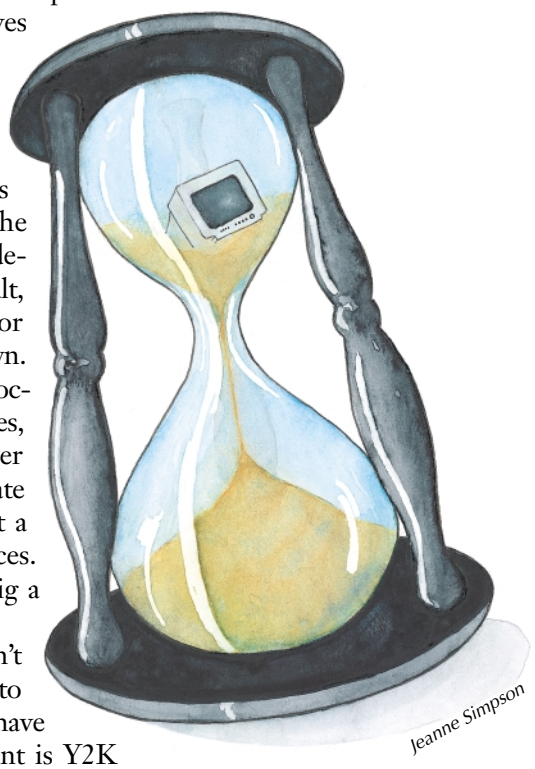
CMAJ 1998;159:697-9

It's a brilliant summer afternoon, but biomedical engineer Robert Knetsch hasn't seen much of the sun. Instead, he's squirrelled away in the basement of the Toronto Hospital's General Division, trying to determine if a Space Labs heart monitor will still work when the clock strikes midnight on Dec. 31, 1999.

It's tedious work. Knetsch must repeatedly set the monitor's internal clock ahead and then watch to see what happens to different functions when it reaches Jan. 1, 2000.

It's also time consuming. This machine takes about 2 hours to test, while others take up to 5. By the time the summer is over, Knetsch and his colleagues will have spent countless hours testing 7000 pieces of equipment.

The work may be boring, says Knetsch, but it is crucial if hospitals are to provide safe and reliable service as the world moves into the next millennium. "It may turn out that we don't have a big problem," he says. "But unless we test everything, we have no way of knowing."



Jeanne Simpson

What Knetsch is testing for is the Year 2000 — the Y2K — bug, the error in time function that could make computers around the world crash at 1 second into the year 2000. The problem is caused by what was meant to be a memory-saving device. Most computers use 2 digits to indicate the year. As a result, they don't understand whether the year "00" means 2000 or 1900, and end up so confused they malfunction or shut down. Computer users have known for years that the problem could occur in word processors, bank machines or telephone switches, but it was only last year that programmers realized that other equipment could also fail, even if it doesn't have an obvious date function. And it dawned on most hospital administrators just a few months ago that this equipment includes medical devices. Since then, they've been scrambling to figure out just how big a problem they face and what it will take to fix it.

The answers aren't coming easily. "The problem is, we don't know what the problem is," explains Carole Griffin, the Toronto Hospital's Y2K project coordinator. Hospital administrators have asked manufacturers to either guarantee that their equipment is Y2K compliant or to help them find and fix the problem. Health Canada has also

asked that manufacturers certify that their equipment is safe, but only 20% have bothered to reply.

According to Philip Neufeld, chief of surveillance in Health Canada's Medical Devices Bureau, most manufacturers either don't know whether their equipment will work or have been advised by lawyers that even if they think it is compliant, they cannot issue a guarantee. "I don't think these are refusals by the manufacturers to cooperate," he says. "They just don't have the data to respond."

Hospitals estimate that about 10% of medical devices will be non-Y2K compliant, but without manufacturers' guarantees they don't know which 10%. The obvious suspects are those with an obvious date function that allows equipment to keep track of records and diagnostic trends. Even if they don't have a date function, many pieces of medical equipment contain an embedded microchip that could be programmed to keep track of the date and time or verify maintenance dates. If that's the case, the chips might not recognize the year 2000 and could malfunction or shut the machine down. For instance, noncompliant electrocardiograph machines could fail to date-stamp output strips properly. That could be nothing more than a minor nuisance, forcing medical staff to add the date and

Y2K bug poses threat to MDs' offices

Experts still cannot say how seriously the millennium bug will affect doctors' offices, but many are advising that they should start looking for potential problems right away. "The lack of information bothers me," says Tom Magyarody, executive director of corporate affairs at the Ontario Medical Association. "It could turn out to be nothing, but if there is a problem and I ignore it, then as a physician I am at great risk for criticism or damages."

Physicians can prepare for Jan. 1, 2000, by looking at 5 areas of their practice.

- Office computers. Most older operating systems and software programs cannot manage dates after 1999, and they will revert automatically to another date, such as the day the system was installed. Since most doctors keep written files, the problem will likely have little effect on patient care. However, there is concern that it might lead to billing errors and payment delays, and leave physicians open to questions about the accuracy of their records. Magyarody, who is coordinating the OMA's Year 2000 project, says physicians should ask their system vendor to verify in writing that their computer is Y2K compliant and follow up by running software that validates the vendor's claim. Many systems can be repaired with a minor upgrade. However, older programs or those made by a company that is out of business will likely need to be replaced.
- Be prepared financially. Most provincial health ministries say their computerized billing systems will be Y2K compliant and that payments will not be interrupted. However, some experts are still worried. Dr. Mark Dermer, an Ottawa family physician and practice management consultant with MD Management Ltd., says all physicians should have a contingency cash flow, such as a line of credit or short-term bank loan, in place by the end of 1999.
- Medical devices. Physicians should follow hospitals' lead and take an inventory of every medical device that plugs in, assess the consequences of a failure and ask the vendor for written assurance that high-risk equipment is Y2K compliant. Magyarody also recommends having an independent test done by a biomedical engineer as extra insurance.
- Infrastructure. Systems such as telephones, modern elevators, heat, water and electricity rely on computers. Although physicians cannot control building systems, Magyarody says they should ask their landlords for assurance that everything possible has been done to ensure that a building's operating systems keep working. "We're talking about linking liabilities," he says. "Doctors should also draw up a contingency plan to deal with infrastructure problems." Dermer says it is also important to check office equipment such as telephones, fax machines and photocopiers and to ask vendors to fix a faulty date function.
- Patient demand. Even if a physician's office is Y2K compliant, other health services may not be. Doctors must be prepared to handle patients who are in hospital or a long-term care facility, or are receiving treatment at home and rely on medical devices such as pain pumps. If these devices fail, doctors' offices could be swamped with calls. "If all hell breaks loose, it's the doctors, not the administrators, who will be dealing with patients," says Magyarody. He says physicians should talk to the medical staff association at their hospital as soon as possible to plan who will be available and for what purposes on New Year's Eve, 1999. Starting next November, doctors should also assess where their patients will be at the dawn of the new millennium so they can prepare for potential problems.

time manually, but patients with cardiac problems often need several electrocardiograms and this increases the chance that the manual date stamp could be overlooked. As a result, the physician would be unable to sequence test results properly. Even more dire consequences would result if alarms on monitors failed to sound or if a device keeps working but makes small errors that aren't readily detectable.

The problem isn't limited to medical devices. Most building systems, such as elevators, heating, security doors and phone switches are controlled by computers. Even if the equipment itself works, it won't be able to function if the computer that controls it fails. Hospitals also depend heavily on outside suppliers, many of which are computerized. If those suppliers aren't Y2K compliant, they may not be able to deliver items such as bandages, syringes or drugs.

What's more, hospitals are often the first place people turn when there's an emergency in the community. If utilities such as heat, water or electricity fail because of computer glitches, hospitals can expect to gain a lot of new residents while their own capacity is diminished, as happened during last winter's ice storm in Eastern Canada.

Millions being spent

Armed only with doomsday scenarios, hospitals across Canada have launched multimillion-dollar programs to prepare for the year 2000. Griffin estimates it will cost the Toronto Hospital "tens of millions" to test and fix equipment and draw up contingency plans. Like many others, the hospital has opted to assess every piece of equipment it owns. "You have to practise due diligence," says Griffin. "You try and do everything to demonstrate that you've done everything possible to prevent this problem."

Griffin, who answers to a special hospital committee, has divided the Y2K project into 5 areas: medical devices, computer systems, building systems, suppliers and support organizations. She has also hired about 10 full-time employees to help existing staff complete the project. No matter which area they're working in, they all have to follow a painstaking process to assess the risk of damages. For medical devices, hospital staff this spring started to draw up an inventory of all the equipment in their area that plugs in or has a battery, and is used for patient care. Each item was then classified according to the level of risk a failure poses to patients. For instance, failure of a high-risk item would threaten a patient's life; these include blood-glucose monitors, defibrillators and infusion pumps. Medium risk means a failure would have a significant impact but would not cause immediate harm. This area includes blood-flow meters, ECG recorders and clinical laboratory equipment. Low-risk items would have no serious impact on patient safety if they fail.

In late July, Griffin hired 10 students to take the inventory again, this time by checking every item in every room in the hospital. As the inventory was compiled, the hospital asked manufacturers for information about whether their equipment is Y2K compliant. Even if manufacturers supply a guarantee, Knetsch has decided that every medical device must be tested, starting with high-risk items.

By late July, Toronto Hospital staff had tested about 350 pieces of equipment; none of the devices shut down completely during the tests and only a handful malfunctioned. However, almost all of them registered a technical failure because they could not log the date properly. The Space Labs heart monitor, for instance, rolls over to different dates, including January 1, ++ and January 1, :0; others revert to the year they were made. Knetsch says results so far suggest the hospital won't face major failures of high-risk equipment, but managers still face the task of deciding how serious the technical failures could be and whether equipment that can't accurately trace dates needs to be repaired or replaced.

We can't replace everything

"Even though it failed a test, we might decide it's nothing to worry about," says Knetsch. "We don't have the money to replace everything, and in a lot of cases it's not worth the money because you don't really care if it's showing a ++."

As the hospital's Year 2000 project moves into the fall, administrators will start assessing the risks posed by that type of failure. Griffin says the Space Labs heart monitor will likely be fixed or replaced; she says medical staff could work around the problem by manually correcting the date, but there's always a chance they will forget. "Because it is a monitor, there is a risk to patients," she says. "The more you put in patches, the more chance there is you will jeopardize care."

Soon, Griffin will also start to draw up contingency plans to cover problems that arise during the first days of 2000. The plan will cover everything from what to do if a medical device fails to how to handle an influx of patients if the city is left without heat or water. Details won't be worked out for several months, but Griffin says she already knows that the hospital will be cutting back on elective procedures for longer than usual over Christmas and New Year's. As well, a command centre will be set up on New Year's Eve and the hospital will be staffed with extra technical experts, administrators and medical personnel.

While the rest of the world celebrates the new millennium with a glass of champagne, it's safe to say that many staff members at Canadian hospitals will be at work, sipping a nonalcoholic punch and watching the clock. ?